

A Green Infrastructure Plan

to Restore, Connect, and Protect
South Carolina's Habitats



Appalachian
Council of Governments Region

Planning for Green Infrastructure involves protecting and connecting the natural and cultural assets of the Appalachian region.



March 2023

Prepared for the state of South Carolina by the Green Infrastructure Center
Funded by the South Carolina Forestry Commission and the USDA Forest Service, Southern Region



Executive Summary

The Appalachian Council of Governments (COG) region contains diverse natural and cultural resources, from lakes and mountains to historic battlefields. With a major interstate highway, I-85, and extensive efforts to diversify the economy, along with abundant natural resources, the Appalachian region is one of the fastest growing areas in the country. <https://www.scacog.org/regions/greenville>

While economic prosperity is very important to the communities in this region, it is vital to grow in patterns that conserve the region's natural resources and habitats. Continuation of local efforts to conserve land, create regional partnerships, and establish both ordinances and planning guidance for growth that protects green infrastructure will ensure the continued high quality of life in the Appalachian region for future generations.

The Appalachian COG region is in the northwest corner of the state, located between Atlanta, GA, and Charlotte, NC, and is bounded on the west by the Savannah River and on the north by the Appalachian Mountains. It encompasses the counties of Anderson, Cherokee, Greenville, Oconee, Pickens, and Spartanburg. The region

includes forests, rivers, waterfalls, wetlands, lakes, and agricultural fields. Its natural beauty and the recreational opportunities afforded by the ancient mountains and lakes attract tourists and new residents, while the diverse and rapidly growing economy is supported by the cities, college towns, and rural areas that make up the region. Approximately 13% of land in the Appalachian COG region is protected in several state parks, national forests, wildlife management areas, and other open spaces.

This region is the ancestral home of the Cherokee, Saluda, and Catawba native peoples.* The Catawba Nation is the only federally recognized tribe currently in South Carolina and has a reservation in the Catawba COG region. The Cherokee Nation, another federally recognized tribe, was relocated to Oklahoma as a result of the 19th century Indian Removal Act, where they remain to this day. Those who avoided relocation are descended from the Eastern Cherokee who together with the Southern Iroquois and United Tribes of South Carolina, are the state-recognized native groups living in this region today.



The Appalachian Council of Governments (COG) region includes mountain, forests, rivers, waterfalls, wetlands, and lakes.

Green Infrastructure Planning Process

This Green Infrastructure Plan comprises a set of maps and strategies for conserving and restoring a connected landscape in the state. GIC led the Appalachian COG and local stakeholders through GIC's Six-Step Green Infrastructure Planning Process with a series of four workshops from 2021-22. This process involved mapping habitats cores and corridors, as well as existing natural and cultural assets, followed by risk analysis to inform strategies for action. With these data, local stakeholders determined priority areas for conservation in the region, as well as strategies to ensure a connected landscape into the future. GIC followed regional COG workshops with state agency engagement. The resulting statewide plan is informed by and includes the COG's regional priorities.

This COG chapter will appear as a separate document, distinct from the full report, since it is one of ten COG chapters that have been included in the statewide assessment. The full report can be found here: <https://scgiplan-gicinc.hub.arcgis.com/> or at www.gicinc.org or <https://www.scfc.gov/management/urban-forestry/>

The statewide scale of this project did not allow GIC to drill down to the level of county and city green infrastructure plans, but did establish important priorities for each region.

1. In the first workshop, GIC presented an overview of the project and shared a map of the region's ranked habitat cores. Feedback on the accuracy of the map and areas of development were noted and incorporated.
2. In the second workshop, GIC presented themed overlay maps that showed the region's agricultural soils, water resources, recreation, and cultural assets and asked workshop attendees to add their local input on additional assets, such as new blueway trails or favorite waterfalls. The final Appalachian asset maps and dataset included new data recommended by participants.

Appalachian FAST FACTS

2,530,560 acres– total COG area (3,954 mi²)

854,400 acres– of habitat cores (1,335 mi²)

34% of COG land area is habitat cores

289,920 acres– of protected cores (453 mi²)

34% of habitat cores are protected cores

323,840 acres– area of protected land (cores and other) (506 mi²)

13% of total area are protected land

158,080 acres– area of public parkland (247 mi²)

6% of total area is public parkland

484,480 acres– area of habitat cores with known cultural/archaeological resources (757 mi²)

292,480 acres– area of habitat cores with highest value ranking (top 5th) (457 mi²)

138,880 acres– area of habitat cores that intersect a groundwater protection zone (376 mi²)

240,640 acres– area of prime agricultural soils on open land (216 mi²)

2,560 acres of wetlands (4 mi²)

974 mi of 1,880 mi (52%)– miles of streams that flow within a habitat core

372 of 989 (38%)– of habitat cores support cultural or recreational assets

26 of 989 (3%)– habitat cores that support known rare, threatened, or endangered species



Appalachian COG

3. In the third workshop, GIC presented draft maps of risks to habitat cores in the region, including development, utility-scale solar development, and impaired waters. Stakeholder feedback about these risks was used to update and finalize the risk maps.
4. In the fourth and final workshop, GIC shared a strategy map that showed ranked habitat cores, protected lands, and regional corridors. The stakeholders then considered priority habitats and risks to those assets and recommended strategies to reduce or prevent impacts to high-value resources.

6-Step Green Infrastructure Planning Process:

1. **Set Your Goals** – What does your community value?
2. **Review Data** – What do we know or need to know, to map identified values? Combine the state modeled data with local data.
3. **Map Your Community's Ecological and Cultural Assets** – Based on the goals established in Step 1 and data from Step 2.
4. **Assess Risk** – What assets are most at risk and what could be lost, if no action was taken?
5. **Rank Assets and Determine Opportunities** – Based on those assets and risks you have identified, which ones should be restored or improved?
6. **Implement Opportunities** – Include natural asset maps in both daily and long-range planning (park planning, comp plans, zoning, tourism and economic development, seeking easements etc.)

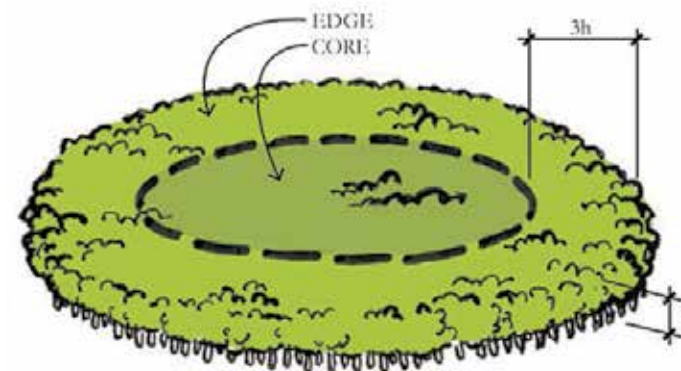
Habitat Cores

Habitat cores are intact areas of the landscape that provide adequate habitat to support native species and were modeled using source data from the 2019 National Land Cover Dataset. Habitat cores are forests, forested wetlands, and marshes at least 100 acres or more in size and are ranked using additional attributes such as water richness, topography, and the presence of rare, endangered, or threatened species. This size is large enough to provide adequate foraging and nesting habitat for interior forest dwelling birds and to support a range of other wildlife species.

Habitat cores encompass 34% of Appalachian COG land area.

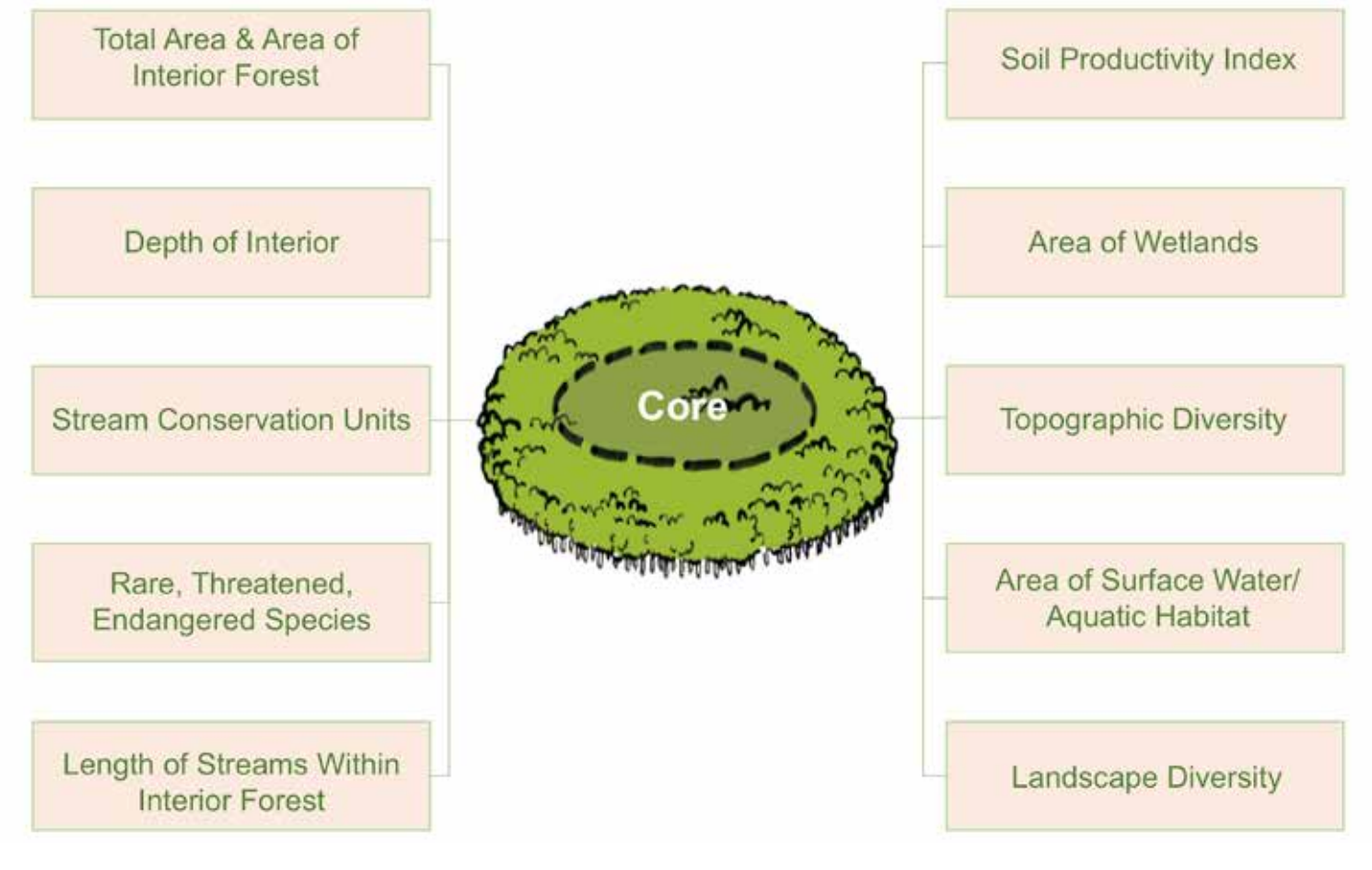
For more on how habitat cores are created, see the Methods and Maps section (page 7) and the Technical Appendix of the full report.

Ranking cores for the values they provide allows land-use planners, agency officials, and site managers to prioritize those specific habitat cores that best meet management goals and objectives, while providing the highest value for species.



Habitat cores consist of an area of intact interior wildlife habitat of 100 acres or more and an edge area that serves as a buffer absorbing impacts from outside the core.

Habitat cores are ranked based on these ecological metrics.

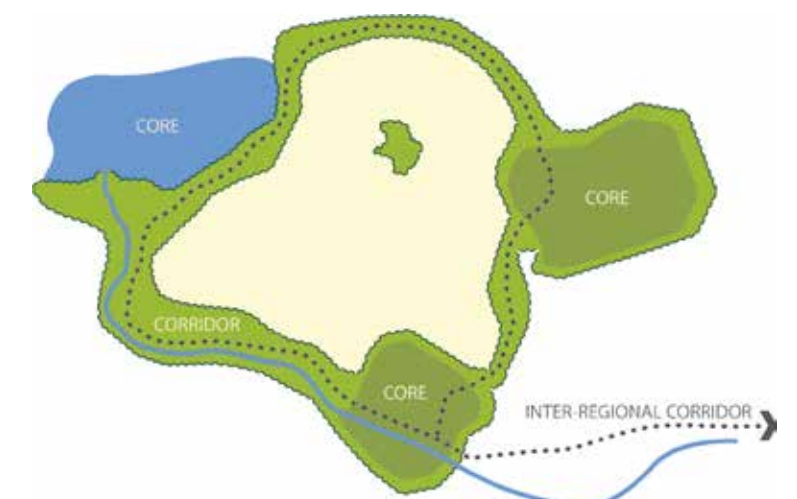


GIC modeled and mapped ranked habitat cores across both the region and state, based on ecological metrics, *see chart above*.

Corridors

Wildlife moves between habitat cores along corridors that support biodiversity by allowing species to move across the landscape and repopulate areas following such disturbances as hurricanes or fires. Restoration or preservation of corridors may also present opportunities to incorporate trails for human recreation. In addition to regional corridors, GIC modeled corridors that are of statewide importance. A graphic representation of this connectivity is displayed on the maps as state and local corridor lines. As the region continues to grow, every effort should be made to continue to maintain these corridors for a more connected and resilient landscape.

For more on corridor modeling see the Introduction section (pages 10 and 11) and the Technical Appendix of the full report.



Green Infrastructure planning is about connecting the landscape. Corridors provide connections between core habitats. A well-connected landscape is more resilient.



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Assets

Natural Assets are the environmental elements that provide healthy surroundings, recreational opportunities, and clean water and food for both people and wildlife. These natural assets include forests, waterways, wetlands, bays, agricultural soils, and other natural resources. Cultural Assets are the landscape elements or uses that people value, such as parks, boat landings, trails, historic or archaeological sites, or scenic vistas and roads that add to the beauty of the area. Natural assets support cultural assets by providing scenic backdrops to historic sites, buffering them from storms and providing settings in which to enjoy them, such as the trails through historic sites that engage visitors in history while they enjoy the natural surroundings. GIC mapped these assets using existing state and national datasets, as well as data from stakeholders. The asset maps include water, agriculture, recreation, and cultural assets. Locating these assets is the first step in protecting them and allows decision-makers and planners to make more informed decisions about growth and conservation.

Risks

Mapping important habitats, agricultural soils, and cultural sites is only a first step towards planning to conserve important assets into the future. Mapping risks to understand which assets are most vulnerable is the next step. GIC analyzed the following risks across the state: sea level rise, storm surge, impaired waters, development, and solar development. These risk maps can be used to determine most critical regional risks and priority areas for conservation. Impaired waters maps can be used to determine areas to target for riparian plantings. Development and solar development maps can guide conservation efforts, as well as planning policy. Tools to mitigate risk can also include establishing solar ordinances, or drawing urban growth boundaries to avoid high-value habitat cores.

Appalachian Risks



33 of 989 (3%) habitat cores with **impaired streams**



481 of 989 (49%) habitat cores at risk of **development**



145 of 989 (15%) habitat cores at risk of **solar development**



559 of 989 (57%) habitat cores at **cumulative risk**



Greenways such as the Swamp Rabbit Trail in Traveler's Rest provide residents opportunities for outdoor recreation.

Regional Observations

The Appalachian region's highest quality habitat cores are clustered in the mountains near the NC, TN, and GA state lines. Additional high-quality cores are found along the river corridors on the south and east of the region: the Savannah River, Saluda River, Tyger River, Pacolet River, and Broad River. The larger wildlife corridors in the region follow these river corridors and connectivity can be restored and protected by maintaining buffers along them. Many of the state's water assets originate in springs in the Appalachian Mountains, making water quality protection an important consideration for the region. Prime agricultural soils in the region are found mostly in Anderson and Spartanburg counties. The region supports cultural assets, such as historic churches and battlefields, as well as waterfalls, with a higher concentration in the mountain counties of Oconee, Pickens, and Greenville. Additionally, recreation opportunities, such as hiking in a state park, paddling a blueway trail, boating or fishing on a lake, or biking along the Swamp Rabbit Trail are abundant in Anderson, Oconee, Pickens, and Greenville counties. The number of assets highlighted in the maps is the result of participation by stakeholders, so the counties that participated in the process are likely to see more of their assets represented on the maps.

Protected lands make up 13% of the total area in the Appalachian COG, close to the statewide rate of 14%. Meanwhile, public parkland in the region is 6% of the total area, above the 5% statewide rate. The Governor has adopted the 30 by 30 goal to preserve 30% of the state by 2030. However, achieving this goal in the Appalachian region will require doubling the acreage of protected land, so local municipalities should continue to work with land trusts, such as Upstate Forever and other organizations, to protect high-value habitats in the region. Currently 34% of regional habitat cores are protected and the habitat cores and corridors map shows the most important lands that still need protection. As tourism and population increase in the region more high-quality public park space will be desirable and habitat cores should be a key consideration for future parkland.

Regional Stakeholders

Participants in the Appalachian stakeholder workshops included representatives from:

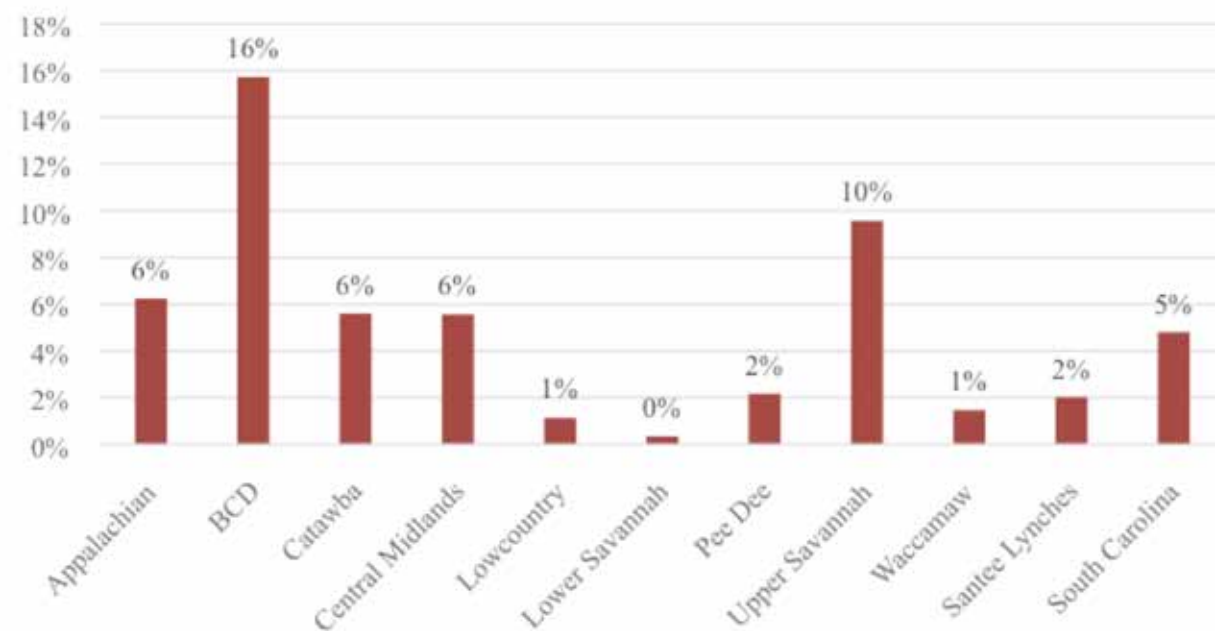
- Appalachian Council of Governments
- Anderson County
- Greenville County
- Oconee County
- Pickens County
- City of Clemson
- City of Gaffney
- City of Greenville
- City of Travelers Rest
- City of Westminster
- Greenville County Soil & Water Conservation District
- Oconee County Soil & Water Conservation District
- Trees South Carolina
- TreesUpstate
- Upstate Forever
- Wildlands Network
- SC Forestry Commission
- SC Department of Health and Environmental Control

The greatest risk for the region is urban development, especially suburban sprawl-patterned growth. Due to steep slopes in the region, solar development is less likely here than in other parts of the state. Urban development risks are greatest along the I-85 corridor and in the Greenville area. Additional development is also likely along I-26, Rt. 123, and near Anderson. Planning for smart, compact growth will be critical to maintain habitat connectivity, food production capability, and quality of life in the region. The Scuffletown rural conservation district is an exemplar of best practices to encourage such development patterns. See <http://www.greenvillecounty.org/apps/LongRangePlanning/uploads/ScuffyAreaPlanReviewBrochure.pdf>



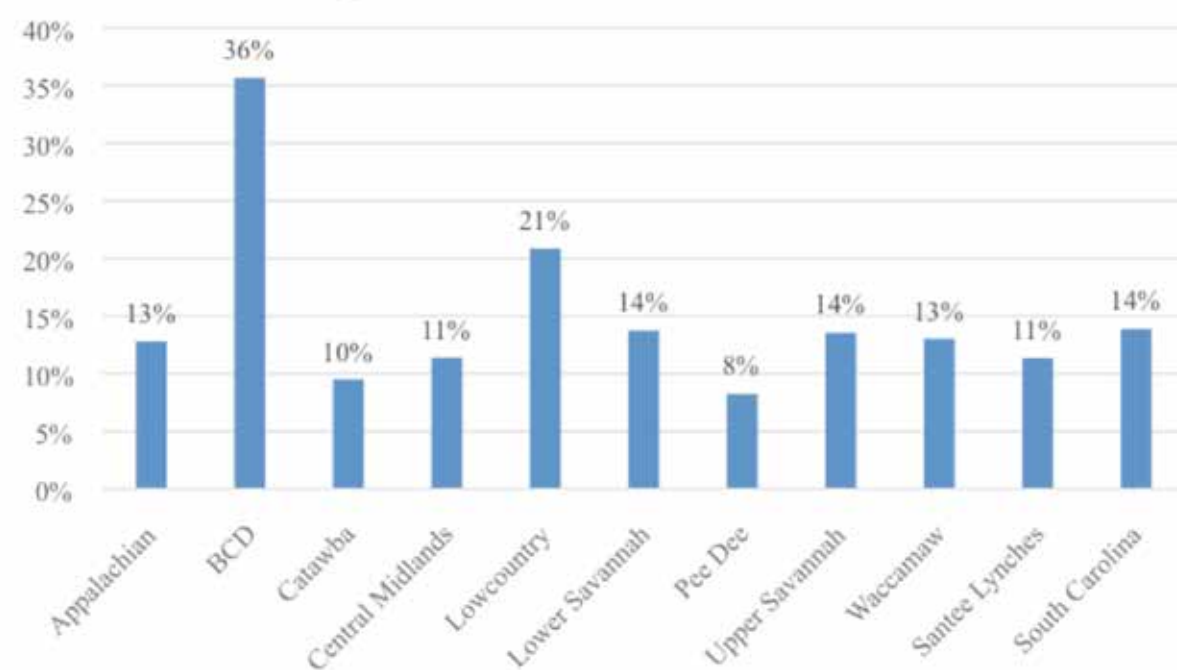
Appalachian COG

Percentage of Total Area that is Public Park Land



The percentage of public parkland in the Appalachian Region is 6%, above the 5% statewide rate.

Percentage of Total Area that is Protected Land



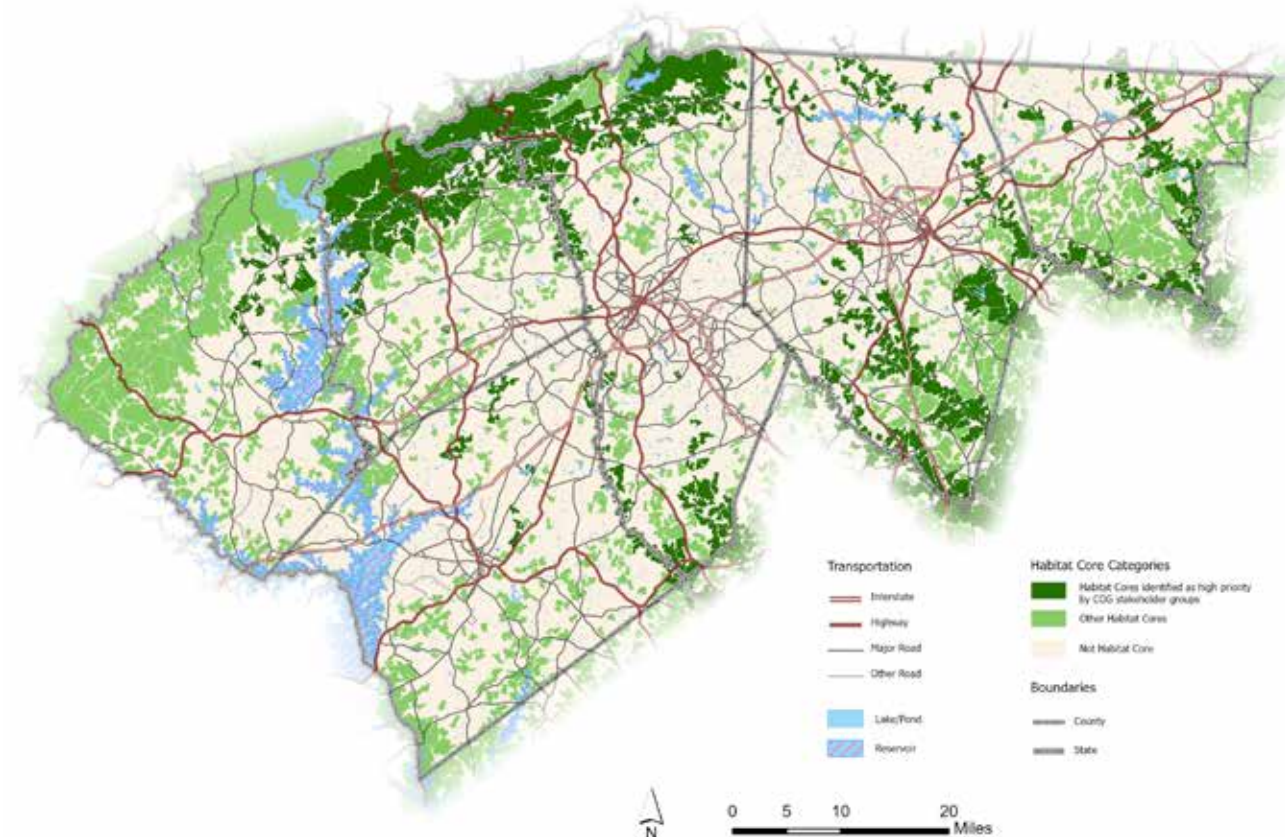
The percentage of protected land in the Appalachian Region is 13%, close to the 14% statewide rate

Appalachian Priority Areas

Appalachian stakeholders identified several areas in the region that are priorities for protection and restoration.

- The Cherokee Scenic Hwy 11 corridor from Walhalla in the west to Gaffney in the east is a priority for preserving the scenic viewshed.
- The Tyger River Watershed is a priority for water quality improvements.
- Fairforest Creek in Spartanburg and Union Counties from Croft State Park to the Sumter National Forest is a priority for protection and timberland preservation.
- Three and Twenty Creek in Pickens and Anderson Counties from Easley to Lake Hartwell is a priority for water quality improvements.
- Eastatoe Valley in Pickens County is a conservation priority for protection of wildlife.
- The North and South Pacolet River Corridors near the state border in Spartanburg and Cherokee counties are a priority for restoration and conservation.
- The Saluda, Tyger, and Pacolet River Corridors are of priorities for protection.
- The Upper Saluda River Corridor is already confirmed as a priority for protection, improved water quality, and additional recreation access. Building on the work that has been done, greater cross-county collaboration between the COG counties of Pickens, Greenville, and Anderson counties, as well as between the Upper Savannah COG and Abbeville, Laurens, and Greenwood counties is recommended.
- Wildlife crossing improvements can be achieved for I-85 at Lake Hartwell. Possibilities include new wildlife crossing installations, wildlife enhancements to existing bridges, and fencing to funnel wildlife towards existing crossing locations.
- The floodplains of Beaverdam Creek and Rocky River northeast of Anderson are a priority for protection as development pressure builds.

Appalachian COG Priority Areas Map





Appalachian COG

Appalachian Strategies

Project maps to inform these strategies can be found at the end of this chapter as well as on the project HUB site <https://scgiplan-gicinc.hub.arcgis.com/>. GIS users can access all the GIS data online and download data for any county. Viewing the data does not require GIS skills.

Strategy 1: Continue to utilize the Greenville Historic and Natural Resources Trust to protect high value habitats.

Greenville County Historic and Natural Resources Trust was seeded \$2 million and is working to protect natural and historic resources in the county. Since its establishment in 2021, the trust has protected more than 400 acres. It should use the assets maps to target high-value habitats that support cultural assets in the Appalachian COG region

Strategy 2: Continue to utilize the Oconee County Land Conservation Bank to protect high value habitats.

Established in 2012, the Oconee County Land Conservation Bank (OCCB) has \$600,000 in funds available (annually) for land conservation. Working with such partners as the South Carolina Conservation Bank, USDA-Natural Resources Conservation Service, Upstate Forever, Naturaland Trust, Oconee Soil and Water Conservation Service, and The Foothills Farmstead, OCCB has been able to leverage its funds to conserve more than 2,800 acres. The OCCB should use the assets maps to target high-value habitats within the Appalachian COG region.

Strategy 3: Expand the use of a Green Space Sales Tax.

Anderson, Cherokee, Greenville, Oconee, Pickens, and Spartanburg counties should consider placing the Green Space Sales Tax on their ballots to raise funds to conserve more land in the region. Counties can use the funds collaboratively to protect land across county boundaries.

Strategy 4: Create and strengthen solar ordinances.

Create solar ordinances in Anderson, Greenville, Pickens, and Spartanburg Counties. Strengthen solar ordinances in Cherokee and Oconee Counties. The South Carolina Energy Office has resources for creating or updating solar ordinances and examples of model solar ordinances.

Strategy 5: Protect water resources in Anderson County.

In 2020, following a pipeline spill settlement, Anderson County established a fund of \$1.5 million for waterways that feed the Savannah River. The fund will be used for protecting and remediating water resource impacts. The GI maps and data produced for the COG should be used to inform locations for water quality improvement work, such as along waterways that lack adequate forested buffers.



Swamp Rabbit Trail in Greenville



Strategy 6: Anderson County is planning for green infrastructure.

Anderson County recently updated its stormwater ordinance and design manual and added a conservation subdivision ordinance and tree ordinance. Additionally, Anderson County is currently conducting a parks and recreation study of its blueways, greenways, and parks. The county should consider locating new parks in areas of high-value habitats using the data and maps created for the Appalachian COG.

Strategy 7: City of Clemson will use tree canopy assessment data to plan for green infrastructure.

The City of Clemson received a technical support grant from the SCFC to receive an urban tree canopy assessment and planning assistance. The city will use these data to prioritize new tree plantings and create an Urban Forest Master Plan.

Strategy 8: City of Travelers Rest will use tree canopy assessment data to plan for green infrastructure and inform its upcoming comprehensive plan.

The City of Travelers Rest received a technical support grant from the SCFC for an urban tree canopy assessment and planning assistance. The city will use these data to prioritize new tree plantings and inform its upcoming Comprehensive Plan.

Next Steps

The data created for this plan is a foundation upon which to build a fine-grained Green Infrastructure Plan. Any municipality or county wishing to pursue a more comprehensive local plan should contact GIC.

The purpose of this project is to identify and prioritize those green infrastructure assets that most urgently require protection or restoration in the state of South Carolina. The strategies and maps of habitat cores, corridors, assets, risks, and priorities provide a roadmap and shared vision for conservation and restoration efforts of state agencies, counties, cities, and landowners. Moving forward, agencies, planners, and citizens can view and download these priorities, maps, and data through the HUB site GIC has created in partnership with Esri. Additionally, the GIS datasets have been disseminated to all the agencies, municipalities, and organizations involved in this project, so they can use the data to guide their decision making.

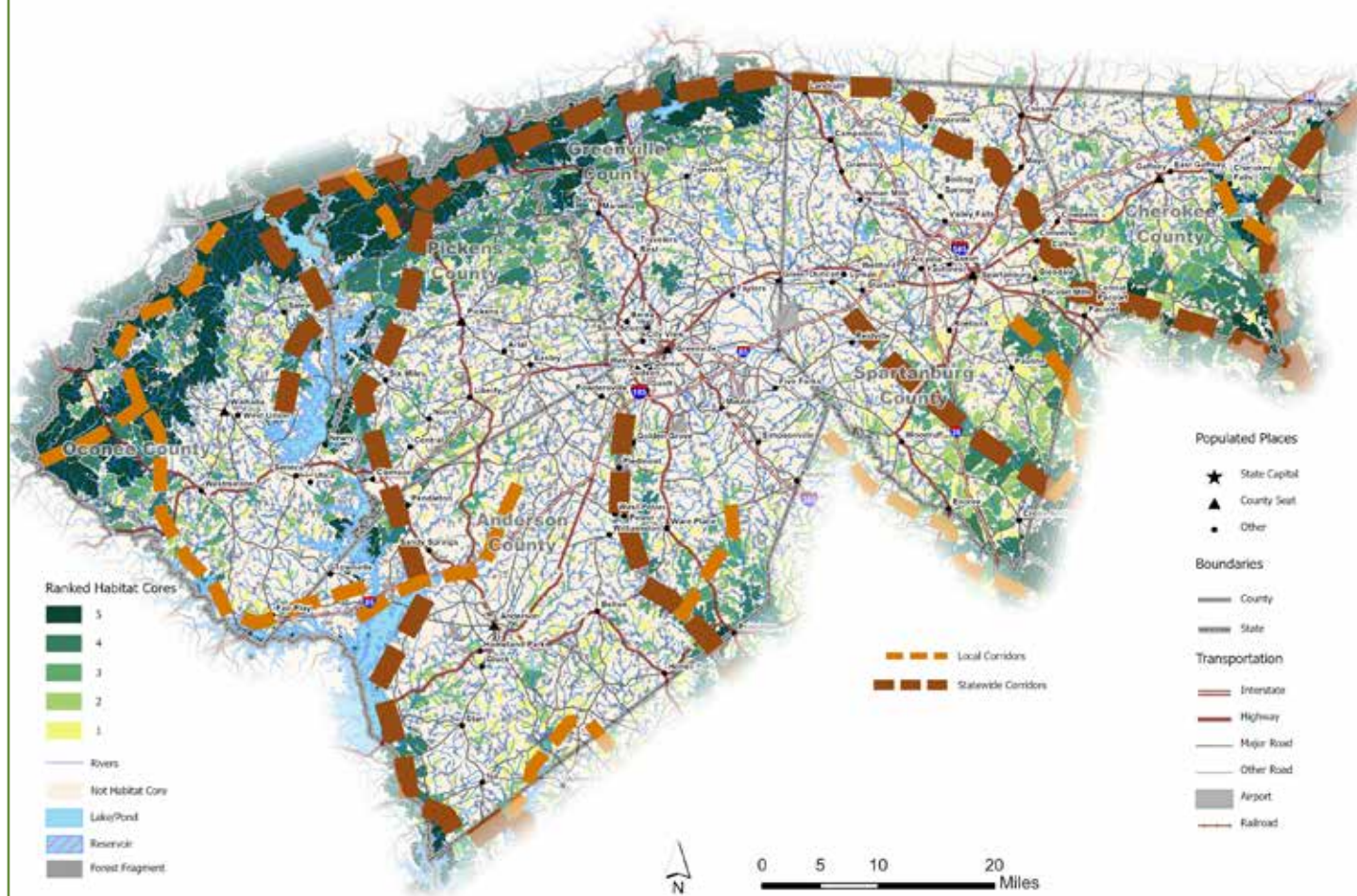
<https://scgiplan-gicinc.hub.arcgis.com/>



Appalachian COG

Maps

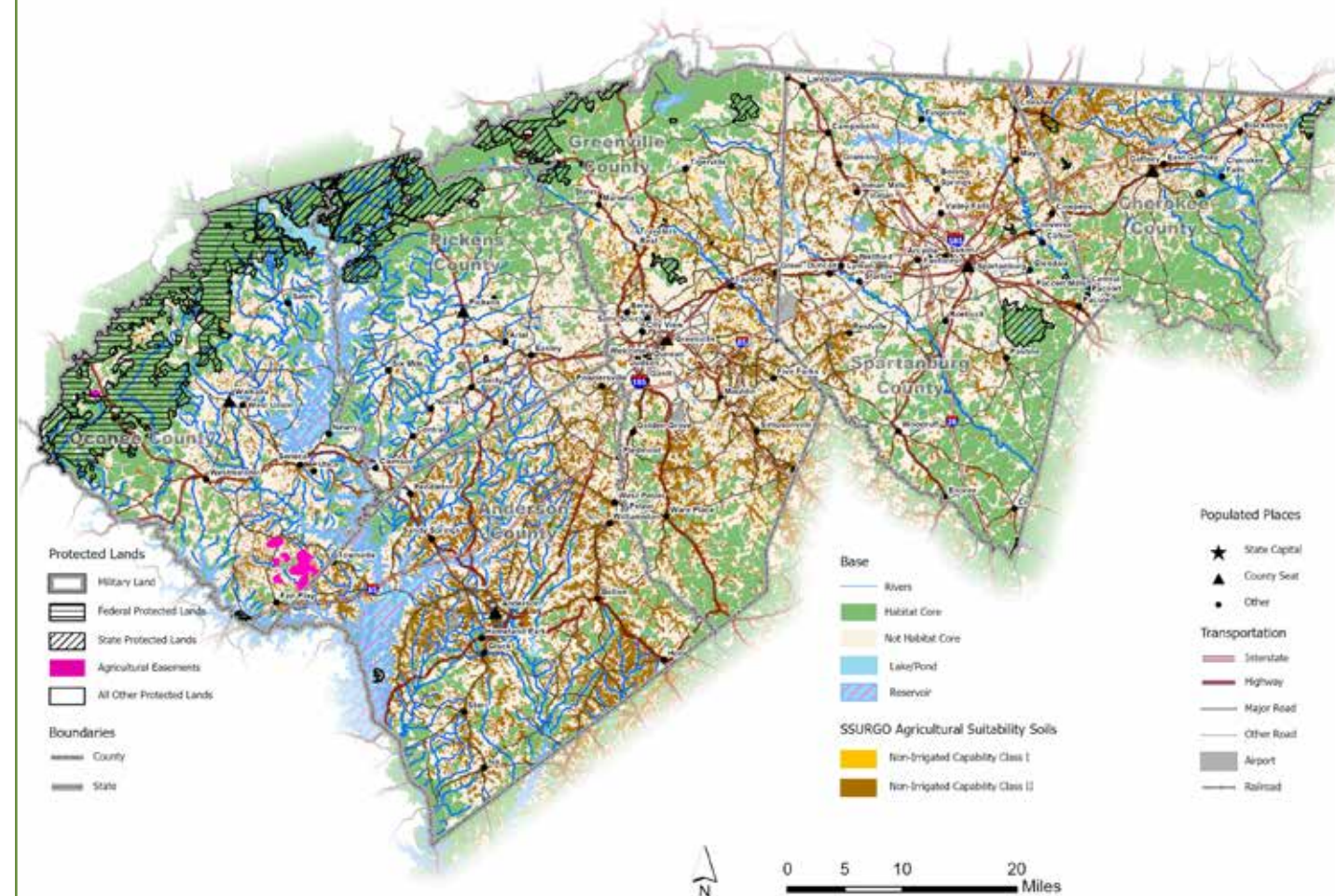
Appalachian Strategic Planning Map: Ranked Habitat Cores and Corridors



Habitat cores are intact natural landscapes large enough to support interior forest or marsh dwelling species. This map depicts the region's habitat cores and shows them connected by corridors to form a network. The more connected the landscape, the more resilient it is and the more pathways there are for people, pollinators, and plants. The habitat cores are ranked based on ecological metrics, with dark green representing the highest quality habitat cores and yellow representing the lowest quality habitat cores. A ranking of 5 is the best and 1 is the lowest. Additionally, statewide and regional wildlife corridors are represented on this map by brown dashed lines.

View all these maps on line and download habitat core data at:
<https://scgiplan-gicinc.hub.arcgis.com/>

Appalachian Assets: Agriculture Map

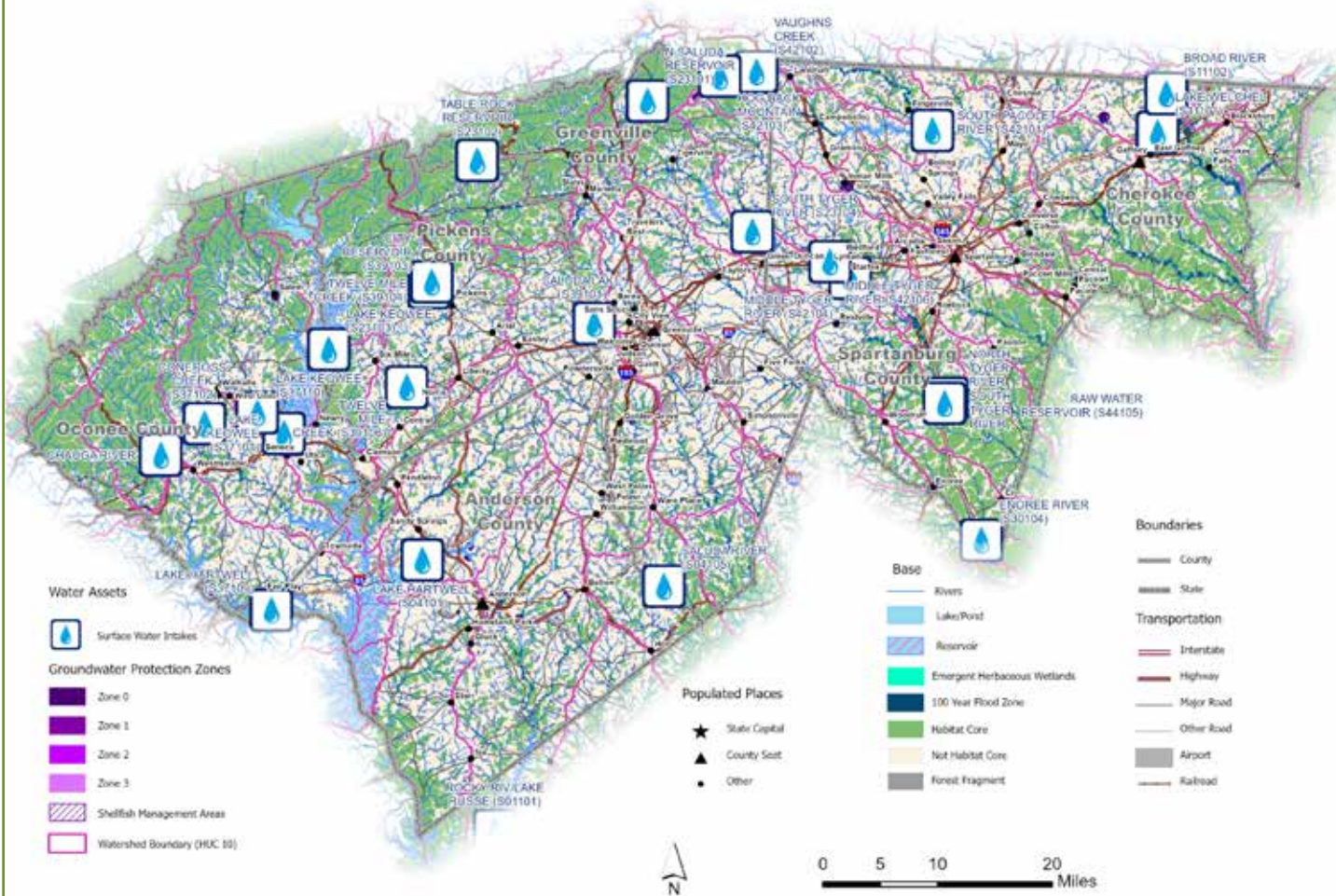


This map identifies the highest quality agriculture soils (classes 1 and 2) on open land, as well as agricultural easements in the region.



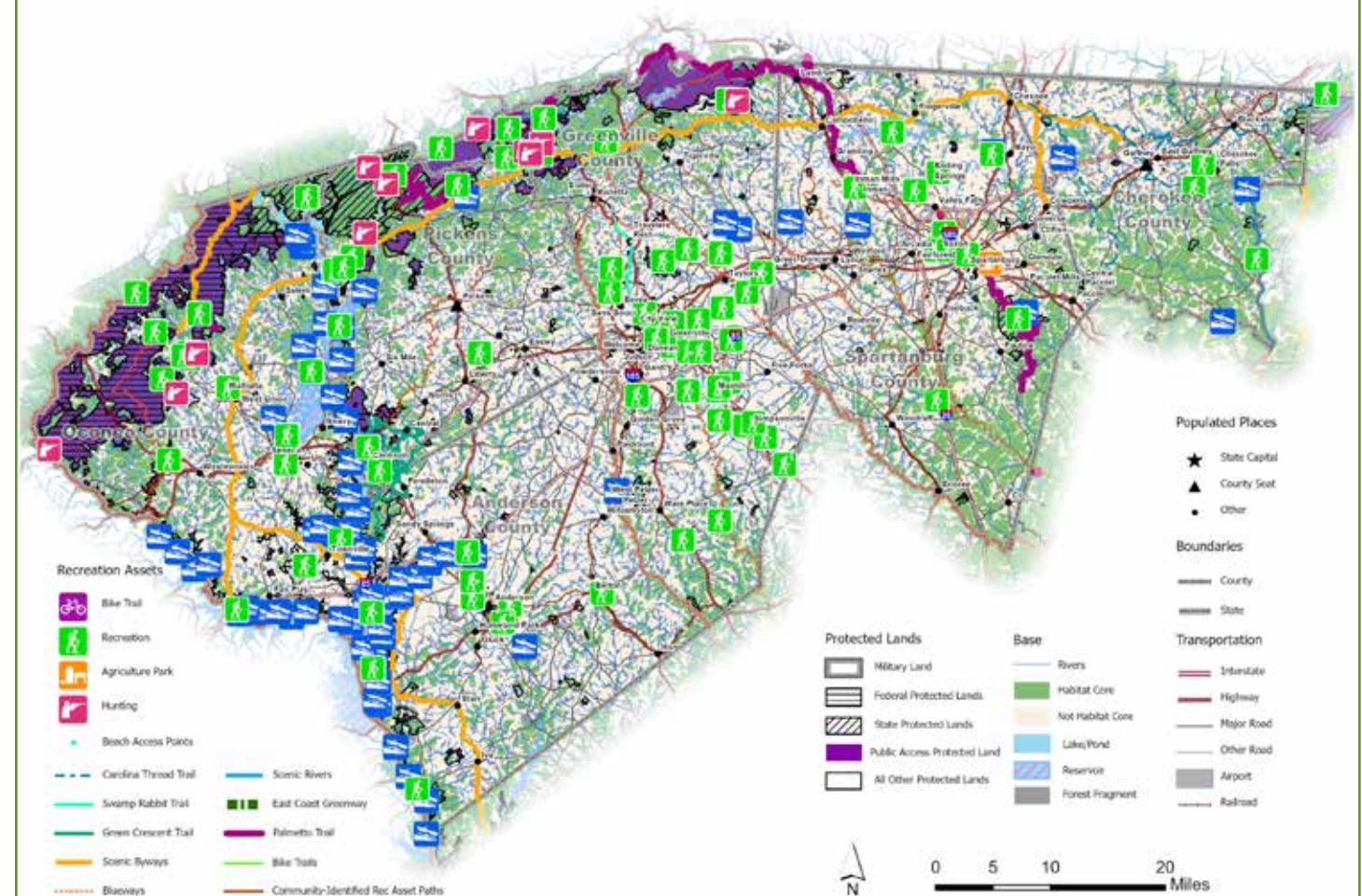
Appalachian COG

Appalachian Assets: Water Map



This map depicts drinking water reservoirs, surface water intakes, groundwater protection zones, and the 100-year floodplain in the Appalachian region. The many forests and wetlands in the region help cleanse runoff to protect surface water quality and provide groundwater recharge.

Appalachian Assets: Recreation Map

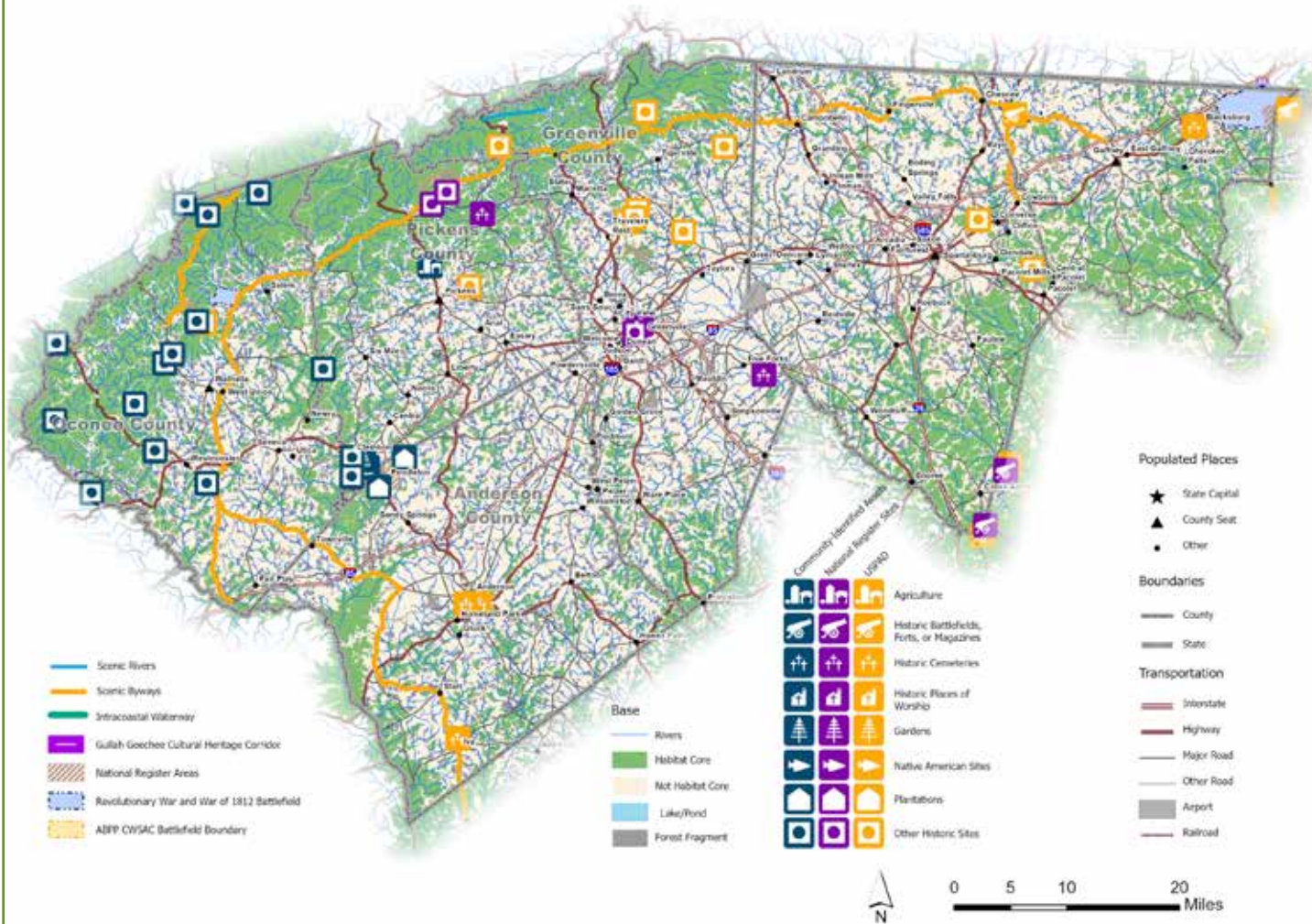


This map depicts boat ramps, blueways, scenic rivers, scenic highways, greenways, Wildlife Management Areas, and federal, state, and local parks over 10 acres in the Appalachian region. Many recreational activities depend on a healthy landscape for their enjoyment, such as hiking, birding, boating, fishing, hunting, and other nature-based sports. A healthy landscape provides both access and scenic settings for enjoying the outdoors. Large intact habitats provide refuge, shelter, and food for the many species that residents and tourists appreciate when enjoying the outdoors.



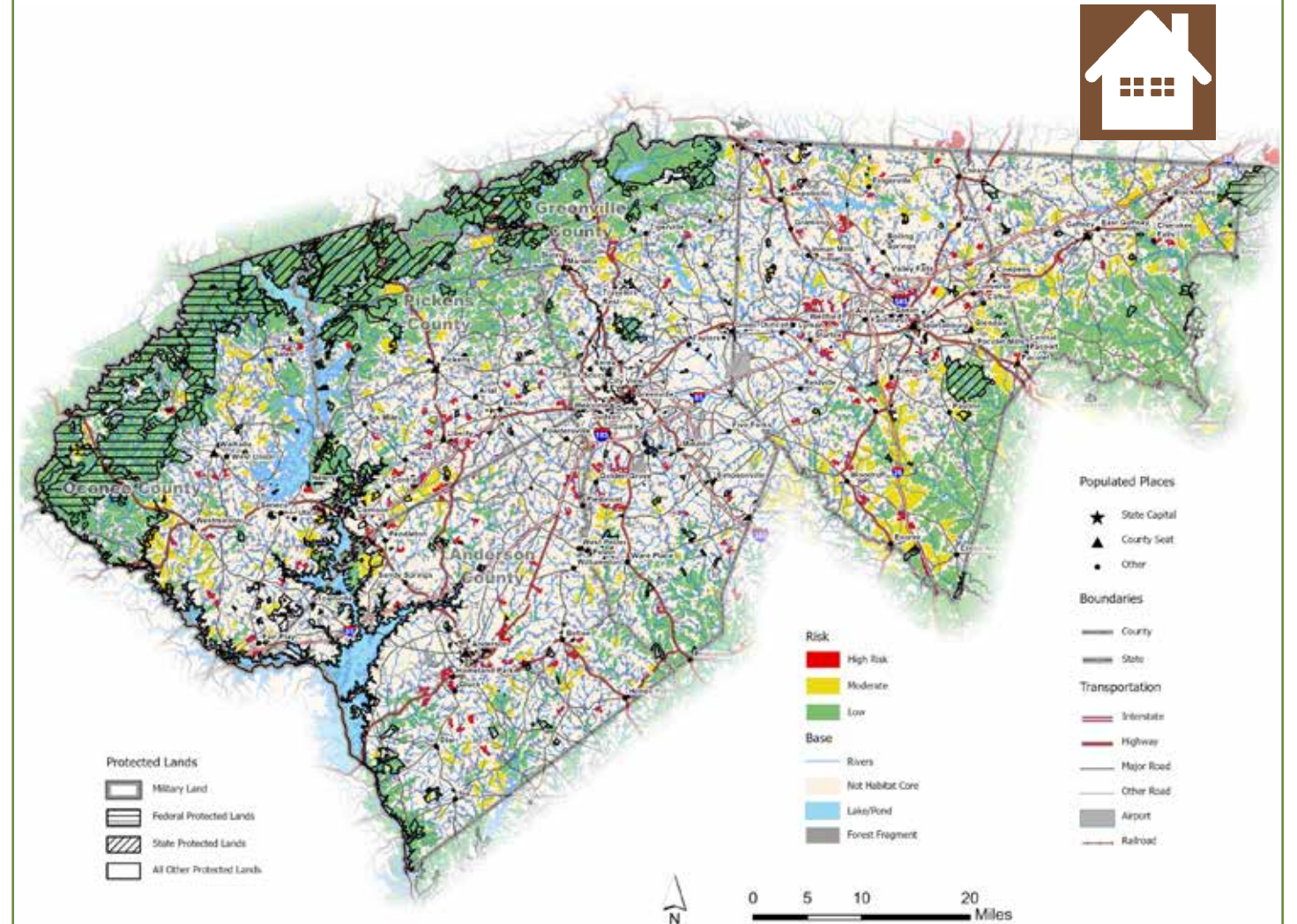
Appalachian COG

Appalachian Assets: Culture Map



This map displays historic sites, Native Peoples sites, cultural overlay districts, scenic highways, scenic rivers, and waterfalls in the Appalachian region. Natural landscapes provide the context, backdrops, and buffers for these sites and contribute to their settings and beauty.

Appalachian Risks: Development Risk Map

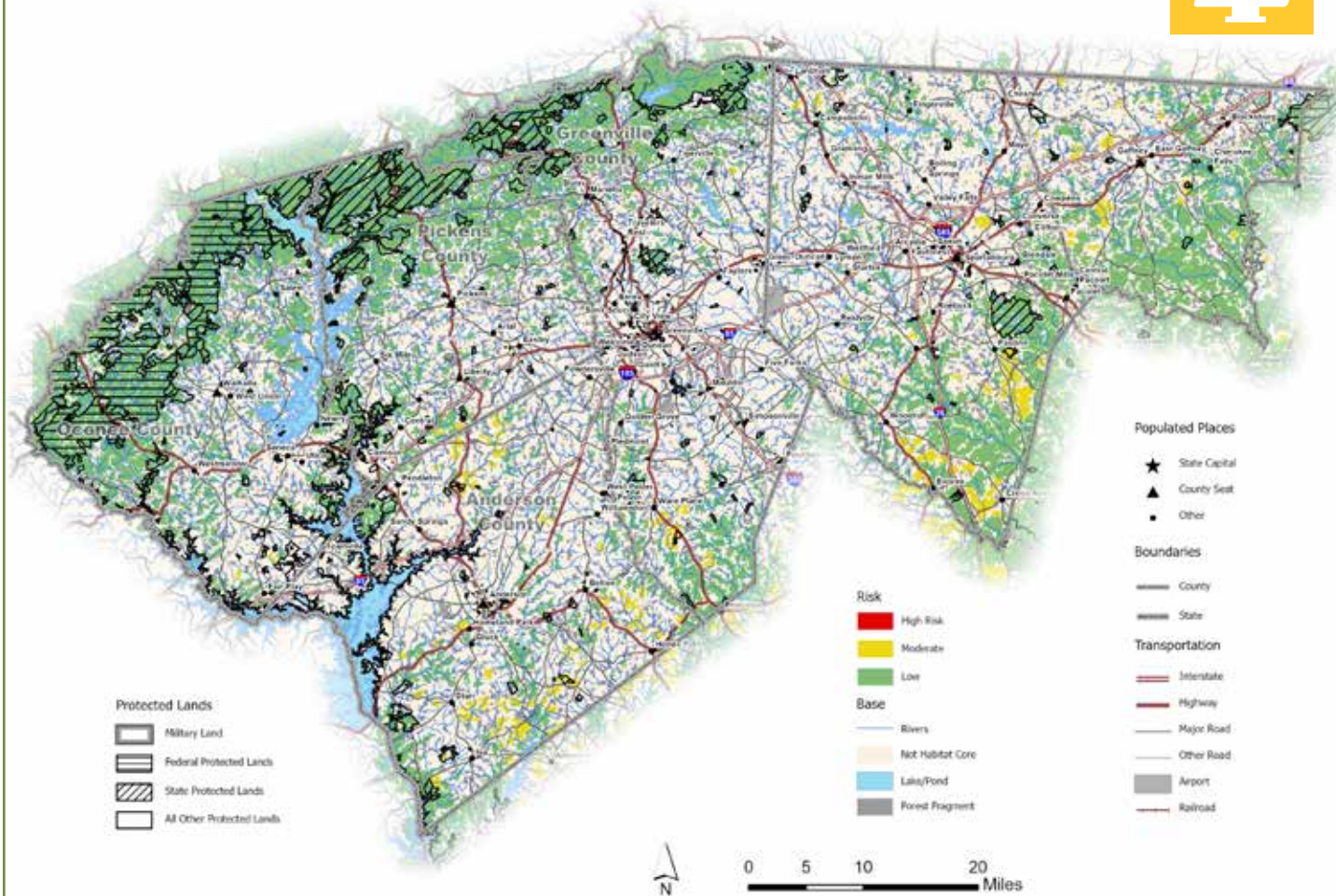


This map depicts the level of development risk based on the SLEUTH Urban Growth Model projected to the year 2060, with protected lands excluded.



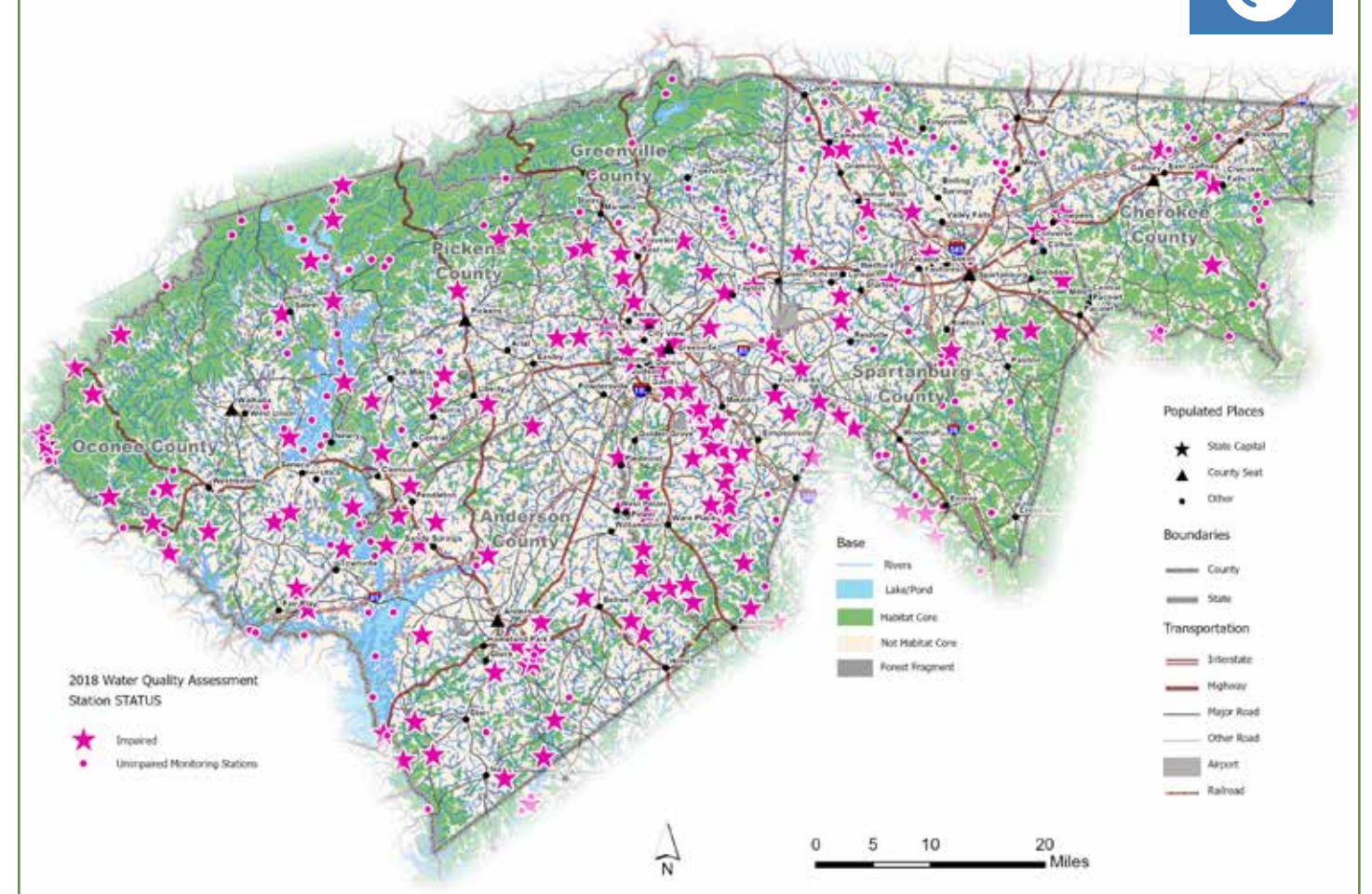
Appalachian COG

Appalachian Risks: Solar Development Risk Map



This map depicts the level of solar development risk based on Argonne Lab's Solar Site Suitability Analysis, with wetlands and protected lands excluded.

Appalachian Risks: Water Quality Impairments Map



This map depicts water quality assessment sites and specific impairments across the region, and includes SC DHEC Water Quality Assessment data.

Notes

*Native people of the Appalachian region as shown on Native Land Map:

Disclaimer from <https://native-land.ca/>

This map does not represent or intend to represent official or legal boundaries of any Indigenous Nations. To learn about definitive boundaries, contact the nations in question.

Acknowledgments

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